

What is claimed is:

1. An ethylene-based copolymer [I]
5 characterized by:
 - (a-1) having temperature (T_m) at the maximum peak in the endothermic curve, measured by a differential scanning calorimeter (DSC), of 40 to 90°C,
 - (a-2) containing the component soluble in decane
10 at normal temperature at 1 to 70% by weight, and
 - (a-3) containing the component soluble in decane at normal temperature which comprises (i) a recurring unit derived from ethylene and (ii) a recurring unit derived from an α -olefin of 4 or more carbon atoms, and
15 in which a content of (i) the recurring unit derived from ethylene is 50 to 75% by mole.
2. An ethylene-based copolymer composition [II] characterized by containing the ethylene-based
20 copolymer which satisfies the following conditions (b-1) to (b-3):
 - (b-1) having temperature (T_m) at the maximum peak in the endothermic curve of the component soluble in decane at 64°C, measured by a differential scanning

calorimeter (DSC), of 40 to 90°C,

(b-2) containing the component soluble in decane at 64°C which contains the component soluble in decane at normal temperature at 1 to 70% by weight, and

5 (b-3) containing the component soluble in decane at normal temperature which comprises (i) a recurring unit derived from ethylene and (ii) a recurring unit derived from an α -olefin of 4 or more carbon atoms, and in which a content of (i) the recurring unit derived
10 from ethylene is 50 to 75% by mole.

3. A propylene-based copolymer composition [III] characterized by containing the propylene-based copolymer and satisfying the following conditions (c-1)
15 to (c-3):

(c-1) containing the component soluble in decane at 64°C at 1 to 99% by weight which has a temperature (T_m) at the maximum peak in the endothermic curve, measured by a differential scanning calorimeter (DSC),
20 of 40 to 90°C,

(c-2) containing the component soluble in decane at 64°C which contains the component soluble in decane at normal temperature at 1 to 70% by weight, and

(c-3) containing the component soluble in decane

at normal temperature which comprises (i) a recurring unit derived from ethylene and (ii) a recurring unit derived from an α -olefin of 4 or more carbon atoms, and in which a content of (i) the recurring unit derived
5 from ethylene is 50 to 75% by mole.

4. An ethylene/ α -olefin copolymer composition comprising:

1 to 70% by weight of [A] a copolymer of ethylene and
10 α -olefin of 4 to 20 carbon atoms which comprises (A-i)
50 to 70% by mole of (a) a recurring unit derived from ethylene and 30 to 50% by mole of (b) a recurring unit derived from an α -olefin of 4 to 20 carbon atoms, and
30 to 99% by weight of [B] an at least one of ethylene-
15 based copolymer comprising (a) ethylene, (b) at least one selected from α -olefin of 4 to 20 carbon atoms and cyclic olefin-based compound, and
having (B-i) a density of 0.870 to 0.895g/cm³.

20 5. The ethylene/ α -olefin copolymer composition according to Claim 4 which has a melt flow rate (MFR at 190°C and a load of 2.16kg) of 0.01 to 50g/10 minutes.

6. The ethylene/ α -olefin copolymer composition

according to Claim 4 or 5, wherein ratio of density (d_b) of said ethylene-based copolymer [B] to density (d_a) of said ethylene/ α -olefin copolymer [A] (d_b/d_a) is 1.05 or less.

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7. The ethylene/ α -olefin copolymer composition according to one of Claims 4 to 6 which has (A-ii) a glass transition temperature of -60°C or lower, determined by a differential scanning calorimeter (DSC) and crystallinity of 1% or less

8. The ethylene/ α -olefin copolymer composition according to one of Claims 4 to 7 which has (A-iii) a B value of 0.9 to 1.5, given by the following general formula (1):

$$B \text{ value} = [P_{OE}] / (2[P_E][P_O]) \quad (1)$$

wherein, $[P_E]$ is molar fraction of the ethylene-derived recurring unit in the copolymer, $[P_O]$ is molar fraction of the α -olefin-derived recurring unit in the copolymer, and $[P_{OE}]$ is a number ratio of the ethylene/ α -olefin copolymer chains to the total dyad chains in the copolymer, determined by the ^{13}C -NMR spectroscopy.

9. The ethylene/ α -olefin copolymer composition

according to one of Claims 4 to 8 which has (A-iv) an intrinsic viscosity $[\eta]$ of 0.1 to 10.0dl/g, determined in decalin at 135°C.

5 10. The ethylene/ α -olefin copolymer composition according to one of Claims 4 to 9, wherein said ethylene-based copolymer [B] has a melt flow rate (190°C and a load of 2.16kg) of 0.1 to 50g/10 minutes.

10 11. The ethylene/ α -olefin copolymer composition according to one of Claims 4 to 10, wherein said ethylene-based copolymer [B] has (B-iii) a temperature (T_m) at the maximum peak in the endothermic curve, measured by a differential scanning calorimeter (DSC),
15 correlated with density (d) by the following relationship:

$$T_m < 400 \times d - 250$$

 12. A resin modifier composed of the
20 ethylene/ α -olefin copolymer composition according to one of Claims 4 to 11.

 13. A method for modifying resin characterized by blending the pellets of the ethylene/ α -olefin

copolymer composition according to one of Claims 4 to 11 and resin to be modified in the molten state.

14. A propylene-based polymer composition
- 5 comprised of the propylene-based polymer [C-1], ethylene/ α -olefin copolymer [A] and ethylene-based copolymer [B], and characterized by:
- (i) containing said propylene-based polymer [C-1] at 99 to 1% by weight, and ethylene/ α -olefin copolymer [A]
- 10 and ethylene-based copolymer [B] at 1 to 99% by weight (total content of [A] and [B]), and
- (ii) having a content ratio of the ethylene/ α -olefin copolymer [A] to the ethylene-based copolymer [B], i.e., [A]/[B] content ratio, is 1/99 to 70/30.

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15. The propylene-based polymer composition according to Claim 14, wherein said propylene-based polymer [C-1] is contained at 98 to 60% by weight, and said ethylene/ α -olefin copolymer [A] and ethylene-based
- 20 copolymer [B] at 2 to 40% by weight (total content of [A] and [B]).

16. The propylene-based polymer composition according to Claim 14 or 15, wherein said propylene-

based polymer [C-1] has a melt flow rate (230°C and a load of 2.16kg) of 0.01g/10 minutes or more.

17. The propylene-based polymer composition
5 according to one of Claims 14 to 16 which has a damping factor peak caused from the glass transition temperature of said propylene-based polymer [C-1] and that caused from the glass transition temperature of said ethylene/ α -olefin copolymer composition [AB]
10 (composed of said ethylene/ α -olefin copolymer [A] and ethylene-based copolymer [B]), when the temperature-dependence of the modulus of elasticity is measured, wherein these peaks are separated from each other.

15 18. A propylene-based copolymer composition comprised of 20 to 93% by weight of [C-2], 6 to 79% by weight of [AB] and 1 to 25% by weight of [D], wherein:
[C-2]: a propylene-based polymer:

(1) having a melt flow rate (MFR, at 230°C and a
20 load of 2.16kg) of 0.1 to 400g/10 minutes, determined in accordance with ASTM D-1238,

(2) containing 0.01 to 30% by weight of the component soluble in decane at normal temperature, and an intrinsic viscosity $[\eta]$ of 0.2 to 10dl/g, determined

in decalin at 135°C, and

(3) having a pentad isotacticity (I_5) of 0.95 or more, determined by the ^{13}C -NMR spectroscopy for the component insoluble in decane at normal temperature;

5 [AB]: a composition composed of:

[A-1]: a copolymer of ethylene and α -olefin of 4 to 20 carbon atoms,

(i) comprising 50 to 70% by mole of (a) a recurring unit derived from the ethylene and 30 to 50%
10 by mole of (b) a recurring unit derived from the α -olefin of 4 to 20 carbon atoms, and

(ii) having an intrinsic viscosity $[\eta]$ of 0.1 to 10.0dl/g, determined in decalin at 135°C, and

[B-1]: a copolymer of (a) ethylene and (b) at
15 least one compound selected from the group consisting of α -olefins and cyclo-olefins of 3 to 20 carbon atoms, having

(i) a density of 0.870 to 0.895g/cm³ and

(ii) a melt flow rate (190°C and a load of
20 2.16kg) of 0.1 to 50g/10 minutes,
wherein the copolymers [A-1] and [B-1] are incorporated at 1 to 50% and 50 to 99% by weight, respectively, based on the whole composition [AB], and
[D]: an inorganic filler.

19. The propylene-based copolymer composition according to Claim 18, wherein ratio of density (d_2) of said ethylene-based copolymer [B-1] to density (d_1) of said ethylene/ α -olefin copolymer [A-1] (d_2/d_1) is 1.05 or less.

20. The propylene-based copolymer composition according to Claim 18 or 19 which has a damping factor peak caused from the glass transition temperature of said propylene-based polymer [C-2] and that caused from the glass transition temperature of said ethylene/ α -olefin copolymer composition [AB], when the temperature-dependence of the modulus of elasticity is measured, wherein these peaks are separated from each other.

21. A formed article of the propylene-based copolymer composition according to one of Claims 18 to 20.

22. The formed article according to Claim 21 which is a sheet or injection-molded article.

23. The formed article according to Claim 21 which is an automobile interior or exterior member, or electric appliance case.

5 24. A propylene-based copolymer composition composed of 20 to 95% by weight of [C-3] and 5 to 80% by weight of [AB-1], wherein:

[C-3]: a propylene/ α -olefin copolymer:

(1) having an intrinsic viscosity $[\eta]$ of 0.01 to
10 10dl/g, determined in decalin at 135°C, and

(2) comprising propylene and 1.5 to 10% by mole of an α -olefin, other than propylene, of 2 to 20 carbon atoms, and

[AB-1]: an ethylene/ α -olefin copolymer composition,
15 composed of:

[A-1]: an ethylene/ α -olefin copolymer of ethylene and α -olefin of 4 to 20 carbon atoms,

(i) comprising 50 to 70% by mole of (a) a recurring unit derived from the ethylene and 30 to 50% by mole
20 of (b) a recurring unit derived from the α -olefin of 4 to 20 carbon atoms, and

(ii) having an intrinsic viscosity $[\eta]$ of 0.1 to 10.0dl/g, determined in decalin at 135°C, and

[B-1]: an ethylene-based copolymer of (a)

ethylene and (b) at least one compound selected from the group consisting of α -olefins and cyclo-olefins of 3 to 20 carbon atoms, having

- (i) a density of 0.870 to 0.895g/cm³ and
- 5 (ii) a melt flow rate (190°C and a load of 2.16kg) of 0.1 to 50g/10 minutes,

wherein the copolymers [A-1] and [B-1] are blended at 1 to 50% and 50 to 99% by weight, respectively, based on the whole composition.

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25. The propylene-based copolymer composition according to Claim 24, wherein ratio of density (d_2) of said ethylene-based copolymer [B-1] to density (d_1) of said ethylene/ α -olefin copolymer [A-1] (d_2/d_1) is 1.05
- 15 or less.

26. The propylene-based copolymer composition according to Claim 24 or 25 which has a damping factor peak caused from the glass transition temperature of
- 20 said propylene/ α -olefin copolymer [C-3] and that caused from the glass transition temperature of said ethylene/ α -olefin copolymer composition [AB], when the temperature-dependence of the modulus of elasticity is measured, wherein these peaks are separated from each

other.

27. The propylene-based copolymer composition according to one of Claims 24 to 26, wherein said
5 propylene/ α -olefin copolymer composition [C-3] has a microisotacticity of 0.8 or more, with respect to the triad chains of propylene.

28. The propylene-based copolymer composition
10 according to one of Claims 24 to 27, wherein said propylene/ α -olefin copolymer [C-3] has a molecular weight distribution (Mw/Mn) of 6 or less, determined by GPC.

15 29. The propylene-based copolymer composition according to one of Claims 24 to 28, wherein said propylene/ α -olefin copolymer [C-3] has a glass transition temperature Tg of -10°C or lower.

20 30. A formed article composed of the propylene/ α -olefin copolymer composition according to one of Claims 24 to 29.

31. The formed article according to Claim 30

